MOBILIZATION FOR THE ATHLETIC TRAINER
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Objectives
- The participant will be to explain the grades of mobilization.
- The participant will be able to explain when to use each grade of mobilization.
- The participant will be able to perform selected mobilizations for pain and increasing range of motion.

Validity of Manual Techniques
- “Grade I and 2 joint mobilizations reduced subjects pain and increased force production in the short-term stages of mechanical low back pain.

Athletic Trainers Performing Manual Therapies/Mobilization
- 5th ed. Education Competency TI-13
  Describe the relationship between the application of therapeutic modalities and the incorporation of active and passive exercise and/or manual therapies, including therapeutic massage, myofascial techniques, and muscle energy techniques.
- 5th ed. Education Competency TI-14
  Describe the use of joint mobilization in pain reduction and restoration of joint mobility.

Joint Mobilization
- Defined: a type of passive movement of a skeletal joint. It is usually aimed at a ‘target’ synovial joint.
- Activates mechanoreceptors
**Brief History**
- Hippocrates 5th century BC, manipulation
- England bone setters 17th century

**Modern Advances in Evaluation and Treatment Systems**
- Dr. James Cyriax: “Father of Orthopedic Medicine”
- Dr. Stanley Paris
- Robin McKenzie
- Brian Mulligan
- Geoffrey Maitland: my training
- Other coursework: International Academy of Orthopedic Medicine-US info@iaom-us.com

**Mulligan**
- Mulligan - NAGS and SNAGS, MWM
- The Mulligan Concept courses are intended for only licensed physical therapists and other clinicians whose scope of practice includes mobilization/manipulative therapy. (PT, MD, DO, DC, OT) In order for PTA’s or ATC’s to attend, your state must allow you to perform mobilization/manipulative therapy.

**McKenzie**
- Minimal Criteria to complete Full Program of Certification (Parts A-D and Credentialing Examination):
  - Healthcare practitioner with at least a Bachelor’s Degree in the field of study AND current license in the state of practice, or registration by the appropriate state or national regulatory organization.
  - In addition to having completed the four part course series, eligible practitioners must have had at least two years of postgraduate clinical experience to take the Credentialing Exam.
  - (Approved healthcare providers: PT, DC, MD, DO, NP, and PA; and in some cases ATC, OT, RCEP (by ACSM), and RN). Depends on the state. Regardless, still able to complete Parts A-C.
Many hypothesis by researchers, chiropracters, PTs, osteopathic and massage based fields

- Movement of nucleus pulposus
- Activation of gate-control mechanism
- Neuromechanical and biomechanical responses
- Reduction in muscle hypertonicity

Hypomobility- leads to decreased synovial fluid and decreased ground substance which leads to joint stiffness.

Additional causes of hypomobility:
- derangement

**McKenzie Institute credentials**
- cert. MDT
  - Mechanical Diagnosis and Therapy
  - David Ruiz, MS, ATC Cert. MDT
  - Practical Applications in Sports Medicine June 1-3, 2012

**Science of Orthopedic Manual Therapy**
- Many hypothesis by researchers, chiropracters, PTs, osteopathic and massage based fields
- Include-
  - Movement of nucleus pulposus
  - Activation of gate-control mechanism
  - Neuromechanical and biomechanical responses
  - Reduction in muscle hypertonicity

**Effects of Mobilization**
- Increase ROM
- Decrease Pain: Stimulates Mechanoreceptors. Mechanoreceptors are believed to alter the pain-spasm cycle through the presynaptic inhibition of nociceptive fibers in associated structures and the inhibition of hypertonic muscles, which ultimately improves functional abilities. (Colloca, C. J., Keller, T. S. 2001)
- Audible “pop” Not necessary for pain reduction. Thought to be the result of “cavitation” in a synovial joint.

**Principles**
- adapted from MT-1 MAPS
  - Know precautions and contraindications
  - Know your limitations
  - Know the patients limitations
  - Be sure to estimate and respect irritability
  - Move inflamed tissue gently
  - Use your trunk-avoid white knuckles, blanched fingernails, tense muscles, remote control, and awkward positions

**Biomechanical Changes**
- Hypomobility- leads to decreased synovial fluid and decreased ground substance which leads to joint stiffness.

**Principles**
- adapted from MT-1 MAPS
  - Assess (examine) -- assess the effects of the examination --treat --assess the effects of the treatment.
  - Focus on the comparable (reproduction of symptoms) sign
  - Assess the Uninvolved side first
  - Let every patient help you refine your skills. Get their response first! Listen!
Principles
adapted from MT–1 MAPS

- Progress treatment by increasing grade, time of each bout, number of bouts and/or position in range
- Let the features of the examination fit a pattern of presentation, do not force a bias fit
- Add a second technique or procedure when you know the effect of the first..KISS
- Assess over 24 hours

Principles
adapted from MT–1 MAPS

- Need normal Accessory (Arthrokinematic) movement for normal physiological (osteokinematic) movement
- Most Arthrokinematic movements are beyond voluntary control
- Use least amount of force
- Avoid paralysis by analysis

3 Primary Assessment Approaches in Manual Therapy

1. Biomechanical analysis approach- coupling motions of the spine, convex-concave rules
2. Patient response approach- movements and treatments based on pt's reports of symptoms provocation and resolution
3. Combination of both

Limitations in our Present Biomechanical Knowledge

- Mac Conaill (1969) used mechanical models in describing Roll, Spin and Glide in G/H joint
- Kaltenborn (1980) used MacConaill’s work “in vivo” studies refute the concave convex rule

- Adapted from MT–1
Literature

- “Assessment of pain provocation during an accessory motion test (PAIVMS) tends to be more reliable than assessments of motion or type of end feel”

- PAIVMS demonstrate that an OMT’s manual examination when accompanied by verbal subject response is highly accurate in detecting the lumbar segment level responsible for a subject’s complaint”

We are going to use the pt. response approach

Five grades of motion

Grade I
- Grade I - Small amplitude, short of Resistance
- Activates Type I mechanoreceptors.
- Indications: Pain

Grade II
- Grade II - Large amplitude, short of Resistance
- By virtue of the large amplitude movement it will affect Type II mechanoreceptors to a greater extent

Grade III
- Grade III - Large Amplitude to 50% of R1-R2.
- Selectively activates more of the muscle and joint mechanoreceptors as it goes into resistance, and less of the cutaneous ones as the slack of the subcutaneous tissues is taken up.
Grade IV
- Grade IV - Small amplitude to 50% of R-R2
- With its more sustained movement at the end of range will activate the static, slow adapting, Type I mechanoreceptors, whose resting discharge rises in proportion to the degree of change in joint capsule tension.

Irritable Disorder
- Constant pain or severe intermittent pain
- Easily provoked
- Long time to settle
- Examples:
  - Acute RA
  - Severe trauma
  - Inflamed chemical pain

Grade V
- Grade V - This is the same as joint manipulation; Small Amplitude, High Velocity thrust at end of available range.

Irritable Disorder (Cont.)
- Rest important
- Appropriate movement can lessen the chance for post inflammatory excessive scar formation

Treatment for Irritability
- Grade I and II
- Brief bouts
- Few Bouts
- Short of the barriers
  - Position in comfort
  - Preferred direction

- R1 - when first feel resistance
- R2 - limit of the resistance
- In general 30 second bouts x 3 times per second = 90 exercises
Treatment for Non-Irritable

- Grade III, IV, and V
- Longer bouts
- Numerous bouts
- Into barriers
- End of range

Arthrokinematic Convex concave Rules

- Standard of biomechanical assessment methods
- Concave surface rotates about a convex surface rolling and gliding occur in same direction
- Convex surface rotates about a concave surface rolling and gliding occur in opposite direction

Fingers should not blanch like this
Painful to patient and you

Passive Mobilization for Headaches
Step 1: Find OA (CO–C1) joints

Passive Mobilization for Headaches
Step 2: Unilateral Posterior to Anterior (UPA) at OA joint

Passive Mobilization for Headaches
Step 3: UPA at C2–3 segment
Passive Mobilization for Headaches
Step 4: UPA at C2–3 segment with 30 degrees rotation

Inferior Glide Shoulder
Increase ABduction(ABD)

Cervical Distraction
Increase ROM

Posterior Shoulder Glide (AP Glide)
Increase Internal Rotation and ABD

Shoulder Distraction
Increases ROM—decreases pain

Anterior Shoulder Glide (PA Glide)
Increase External Rotation and Extension
Scapular Mobilization Distraction - Increases movement

Humeroulnar Distraction General Increase of Motion

Scapular Mobilization Inferior glide - Increases downward rotation

Lateral Elbow Stretches Lateral Epicondyle Structures

Thoracic Spine CPA and UPA Decrease pain, Increase extension

Humeroradial Distraction Decrease Pain, Increase Elbow extension and Radial motion
AP Humeroradial Joint
Increase Flexion

Proximal Radioulnar Joint
Anterior Glide (PA)– Increase
Supination
Mobilizing had grasps the radius
Stabilizing hand grasps the ulna

PA Humeroradial Glide
Increase extension

Hand Position for Mobilizing
Lumbar Spine

Proximal Radioulnar Joint
Posterior Glide (AP)– Increase
Pronation
Mobilizing had grasps the radius
Stabilizing hand grasps the ulna

Lumbar spine CPA and UPA
Decrease pain, Increase
extension
Hip Distraction
Decrease pain, Increase ROM

Knee Posterior Glide
Increase flexion

Hip Lateral Glide
Increase ABD & General Mobility, Decrease Pain

Knee Anterior Glides
Increase Extension

Hip Anterior Glide (PA)
Increase hip extension & ER

Medial Patellar Glide
Subtalar Distraction
Increase General Mobility

Subtalar Joint Lateral Glide
Increase Subtalar Inversion

Anterior Glide of Tibia on Talus
Increase Plantarflexion

Subtalar Joint Medial Glide
Increase Eversion

Posterior Glide Talocrural Joint
Increase DF

Questions?